

Date: Fri, 19 Nov 93 04:31:00 PST
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V93 #107
To: Ham-Homebrew

Ham-Homebrew Digest Fri, 19 Nov 93 Volume 93 : Issue 107

Today's Topics:

 Low-cost VHF amplifier application note
 single sideband

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Tue, 16 Nov 1993 22:42:25 GMT
From: world!dts@uunet.uu.net
Subject: Low-cost VHF amplifier application note
To: ham-homebrew@ucsd.edu

In article <gila005-161193124904@spam.dom.uab.edu> gila005@uabdp.dpo.uab.edu
(Stephen Holland) writes:

>In article <holland-151193111058@beagley.dom.uab.edu>,

>holland@gasmac.dom.uab.edu (Steve Holland) wrote:

>>

>> One person asked about what application note had a reference to
>> a vhf power amplifier. I got several from Motorola. One, a
>> broadband 300 watt amplifier from 10 to 300 MHz was interesting
>> until I saw the power transistor alone cost about \$300 in quantity
>> of one. A much more affordable amplifier was described in
>> engineering Bulletin EB-90, Low-cost VHF amplifier has broadband
>> performance. It uses the MRF 260 and MRF 262 and includes the
>> PCB pattern in the note. 15 Watts output at 146 MHz.

>>

>> Darn, I realize I had another note for a higher power amplifier
>> power amplifier which included an automatic T/R relay in the

>> design. I'll post on that when I bring it into work.

>

>The other note of interest is AN-791m a 75W and 35W power amp optimized
>for 144-148 MHz. It has a built in carrier operated relay, which stays
>up in SSB and CW with a built in delay on releasing the relay.

>

>To the person who emailed me, the responses bounced.

>

>There are kits for these amps from communication concepts,

>508 Millstone Drive

>Beaver Creek OH 45434-5840

>513-426-8600

>

>The 35 watt and 75 watt amps are \$80 and \$120 respectivley.

>

>Does anyone have experience dealing with them?

>

>Steve Holland

I have built one of each size. The 75 watt one has been on a repeater for quite some time now (over a year). I had to rebuild it a while back because the RF sensing circuit was chattering the relay. I do not know why, but the amplifier was going into oscillation. For the repeater case, I just added a jumper so that when power is present, the relay is pulled down, putting the amp into line. The only reason I did not eliminate the relay altogether is that we want the amp out of line when the AC power fails. For repeater use, I added a fan on the heatsink.

I loaned out the 35 watt model and a power supply to a new ham who had been in one of my ham radio classes (I do LOTS of elmering!) and it worked fine for a few days, then it developed the same problem with oscillation. Fixing this one is harder, since I really DO want the RF sense switch to work. I tried rebiasing the thing to class C, but there is still a problem with oscillation after the first time RF is applied. This one is going to wind up in the hands of the master (WA1RHP, an expert at solid state amplifiers), to see if he can get it to work.

The old adage is true: you try to build an amplifier and you get an oscillator. Try to build an oscillator and you get an amplifier!

If you are looking for a finished product, look at TE systems or RF Concepts. (Stay away from Mirage).

--

Daniel Senie

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Daniel Senie Consulting
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n1jeb@world.std.com
Compuserve: 74176,1347

Date: Tue, 16 Nov 1993 13:15:36 GMT
From: munnari.oz.au!spool.mu.edu!sdd.hp.com!hpscit.sc.hp.com!hplextra!hplb!
hpwin052!hpqmoea!dstock@network.ucsd.edu
Subject: single sideband
To: ham-homebrew@ucsd.edu

As has been already mentioned, good alternate sideband rejection still requires better than reasonably achievable gain and phase precision to get exact cancellation.

Subtraction processes are always bad on accuracy requirement.

I don't see anyone putting much more effort into this area. DSP is fast becoming cheap, and it is possible to create really good SSB at a low IF using DSP and the sort of 12 bit DAC aimed at the Graphics and DDS markets. This will give a system with no adjustments, no setting up, and no temperature stability problems.

Receivers are more demanding and ADC performance development tends to lag DAC developments. There are receivers on sale that digitise a low IF and then use DSP, but ADC performance is not yet such as to allow competition with the best analogue filter based receivers. Ring-proof CW filters could prove popular!

Cheers

David GM4ZNX

Date: 16 Nov 1993 20:39:25 -0500
From: concert!news-feed-1.peachnet.edu!gatech!howland.reston.ans.net!
sol.ctr.columbia.edu!news.mtu.edu!news.mtu.edu!not-for-mail@decwrl.dec.com
To: ham-homebrew@ucsd.edu

References <1993Nov13.164257.15906@cs.rit.edu>,
<1993Nov14.020154.9354@ke4zv.atl.ga.us>,
<Nov15.155239.54713@yuma.ACNS.ColoState.EDU>ia.edu
Subject : Re: single sideband, phasing and T2/R2

Galen Watts (galen@picea.CFNR.ColoState.EDU) wrote:
: In article <1993Nov14.020154.9354@ke4zv.atl.ga.us> gary@ke4zv.UUCP (Gary
Coffman) writes:

: >In article <1993Nov13.164257.15906@cs.rit.edu> atd@cs.rit.edu (Albert T Davis) writes:

: >>I have been out of this for a while....

: >>Is the filter method still the most common for SSB generation?

: >>It seems to me that the phasing method is far superior with today's technology

: >>al.

: >It remains difficult to achieve a precise 90 degree phase shift over

: >3 octaves of audio frequencies. DSP offers the potential to solve that

: >problem though.

: >Gary Coffman KE4ZV | Life's a journey, | gatech!wa4mei!ke4zv!gary

: >Destructive Testing Systems | not a destination. | uunet!rsiatl!ke4zv!gary

: >534 Shannon Way | Live it. | emory!kd4nc!ke4zv!gary

: >Lawrenceville, GA 30244 | |

: In the April, 93 issue of QST is the 'Multimode Phasing Exciter' alias the
: T2 board. Uses 1% componenets in the phase shift network. I have the board
: (along with the companion R2) but I haven't built it, as I can't decide if
: I should put it on 440 SSB or 1750m CW/SSB. You must also have a 90 deg.
: phase shift for the RF, which I can get for 440 from Mini-Circuits.

: Anybody built these boards and willing to talk?

: Galen, KF0YJ

Why buy a phase shifter for RF?

...just use a 1/4 wave piece of transmission line after the power divider...

Date: 16 Nov 1993 09:55:30 +0200

From: munnari.oz.au!spool.mu.edu!uwm.edu!cs.utexas.edu!howland.reston.ans.net!
pipex!sunic!news.funet.fi!butler.cc.tut.fi!lehtori.cc.tut.fi!not-for-
mail@network.ucsd.edu

To: ham-homebrew@ucsd.edu

References <2c4lhr\$6pi@hpscit.sc.hp.com>, <1993Nov15.164550.18931@cs.rit.edu>,
<2c8ohb\$abo@hpscit.sc.hp.com>sunic

Subject : Re: single sideband

Richard Karlquist (rkarlqu@scd.hp.com) wrote:

[about using phasing receivers]

> Of course the problem with this method is you will be limited to
> 40 dB. or so selectivity for the opposite sideband (which is really
> the adjacent "channel" so to speak.) That is pretty lousy receiver
> performance.

This is a problem in crowded bands, but what about less crowded VHF/UHF bands ? Most likely the "adjacent" channel contains only white noise. Going from 0 dB opposite sideband suppression (DSB) to infinite (SSB) will improve the SNR by 3 dB. A very modest 10 dB opposite sideband suppression will give 2.5 dB improvement in SNR.

On the transmitter side, if the most important factor is not spectral efficiency, a 10 - 20 dB opposite sideband suppression should be enough. The reduction of the power level of the desired sideband would be hardly noticable.

As long as such rigs are used only on bands with low activity, modest opposite sideband suppression should not hurt anyone. It is better to have some activity on these bands than no activity at all.

Paul OH3LWR

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FINLAND

Date: 18 Nov 93 15:16:24 GMT
From: ogicse!emory!kd4nc!ke4zv!gary@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <Nov15.155239.54713@yuma.ACNS.ColoState.EDU>,
<2cbvcd\$m8q@maxwell21.lee>, <CGo6Au.AAn@seastar.org>
Reply-To : gary@ke4zv.atl.ga.us (Gary Coffman)
Subject : Re: single sideband, phasing and T2/R2

In article <CGo6Au.AAn@seastar.org> jjw@seastar.org (John Welch) writes:
>> Why buy a phase shifter for RF?
>> ...just use a 1/4 wave piece of transmission line after the power divider...
>
> Unless you use Teflon coax, the variation in velocity factor
> from foot to foot makes it difficult to get exactly 90 degrees by
> calculating the length in inches.
> A 90 degree length of coax at 160M is rather long.

> A 90 degree chunk of coax is only 90 degrees at one very
>narrow range of frequencies.
> Unless you have a *lot* of patience and time, it's far easier
>to use a pre-built component that you already know works.
> A 90 degree chunk of coax induces some loss, and thus some
>amplitude imbalance.
>
> I once seriously considered phasing using the Qualcomm dual DDS
>chip, setting the second DDS to be 90 degrees plus or minus from the
>first, but differences in the DACs and filters induced too much
>amplitude and phase shift for the sharp selectivity I wanted. I found
>I could get what I wanted only if I also used a crystal filter too,
>and at that point the expense of phasing became a drawback. I'd still
>like to do it some day, though...

There's a real simple way to get a 90 degree shift. Have your oscillator
drive a divide by four circuit arranged as one JK driving two other JKs,
one driven by Q and the other driven by not Q. You can take your quadrature
components from the latter pair of FFs. Of course your oscillator must
run at 4X the IF frequency, but that's not a problem. If you use HS parts
for the JKs, your quadrature outputs will be nearly ideal square waves
which is exactly what you want to drive diode ring mixers efficiently.

Getting that blankety blank audio phase shift to be exactly 90 degrees
at every frequency over a 3 octave range is still the hard part.

Gary

--

Gary Coffman KE4ZV	Where my job's going,	gatech!wa4mei!ke4zv!gary
Destructive Testing Systems	I don't know. It might	uunet!rsiatl!ke4zv!gary
534 Shannon Way	wind up in Mexico.	emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244	-NAFTA Blues	

Date: 17 Nov 1993 03:38:08 GMT
From: sdd.hp.com!hpscit.sc.hp.com!rkarlqu@decwrl.dec.com
To: ham-homebrew@ucsd.edu

References <1993Nov14.020154.9354@ke4zv.atl.ga.us>,
<Nov15.155239.54713@yuma.ACNS.ColoState.EDU>, <2cbvcd\$m8q@maxwell21.ee>
Subject : Re: single sideband, phasing and T2/R2

In article <2cbvcd\$m8q@maxwell21.ee>,
Daniel E. Carlisle <decarlis@mtu.edu> wrote:
>Galen Watts (galen@picea.CFNR.ColoState.EDU) wrote:

>: (along with the companion R2) but I haven't built it, as I can't decide if

>: I should put it on 440 SSB or 1750m CW/SSB. You must also have a 90 deg.
>
>: Galen, KF0YJ
>

>Why buy a phase shifter for RF?
>...just use a 1/4 wave piece of transmission line after the power divider...
>

The 1/4 wave line gets kinda long on 1750m!

End of Ham-Homebrew Digest V93 #107

